

"I may amplify this by stating for your information that the tariff of the Montreal hotels ranges from \$2 50c. to \$4 per day inclusive, and that private accommodation can be obtained at much lower prices than in England.

"(III.) 'A scheme of expeditions which would occupy from two to three weeks subsequent to the meeting, and the cost of each of them.'

"Dr. Sterry Hunt says:—'As to the proposed excursions, we are prepared to say that the Grand Trunk, the Canada Pacific, and the Intercolonial Railways will furnish free transportation over their lines throughout the dominion of Canada from Nova Scotia to the North-West. The Canada Pacific will also arrange an excursion to the Rocky Mountains, and the Grand Trunk one to the Great Lakes (note: this will include Niagara) and Chicago; while the South-Eastern Railway will do the same for the White Mountains and Portland and Boston. For an excursion of this kind, occupying three or four weeks, tourists should be provided with, say, 20*l.* in money for hotels, carriages, and other incidental expenses, though it is possible that a less sum than this would be needed.'

"I am inclosing a copy of a circular that has been prepared by the Montreal committee. It contains interesting information, and it will be seen that the arrangements are in the hands of representative and eminent men.

"I believe from the information that reaches me that the Association will receive the addition of a considerable number of associates in Canada, and that the visit will give an impetus to scientific research in the Dominion such as it has not experienced before. It is confidently anticipated also that the American Association will hold its meeting in 1884 at a convenient time and place, affording an opportunity for scientific intercourse that I imagine does not often occur.

"I will gladly supply any further information you may require if it is in my power to do so, and shall readily cooperate in any measures having for their object the success of the meeting of the British Association for the Advancement of Science at Montreal in 1884.

"I am, dear Sir, your obedient servant,

"A. T. GALT,

"High Commissioner for Canada, and Vice-Chairman of the Montreal Citizens' Committee

"Prof. T. G. Bonney, M.A., F.R.S., F.G.S., &c.,

"22, Albemarle Street, W."

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—The Savilian Professorship of Geometry in the University is vacant, and an election to the office will be held before the end of Trinity Term (July 7, 1883). A Fellowship in New College is now annexed to the Professorship. The duty of the Professor is to lecture and give instruction in pure and analytical geometry. The combined emoluments of the office from both sources will be, for the present, 700*l.* a year, but may possibly hereafter be increased to an amount not exceeding 900*l.* a year. The qualifications required in candidates for the Savilian Professorships by the existing Statutes of the University are as follows:—"Hos Professores sive lectores, prout voluit fundator, statuimus et decernimus fore perpetuis temporibus eligendos ex hominibus bonæ famæ et conversationis honestæ, ex quacunque natione orbis Christiani, et ejusque ordinis sive professionis, qui in mathematicis instructissimi sint, et annos ad minimum sex et viginti nati; et, si Angli fuerint, sint ad minimum Artium Magistri." Candidates are requested to send to the Registrar of the University their applications, and any documents which they may wish to submit to the Electors, on or before Thursday, May 31.

VICTORIA UNIVERSITY.—At a meeting of the University Court on March 30, Vice-Chancellor Greenwood laid on the table the supplementary charter, dated March 20, 1883, enabling the University to confer degrees and distinctions in medicine and surgery. After some discussion it was resolved that the Council be empowered and instructed to appoint external examiners in medicine and surgery for a limited period, and to appoint certain lecturers of the University to act as University examiners; also to prepare, after a report from the General Board of Studies, a statute or statutes and regulations relating to degrees in medicine and surgery for the consideration of the Court, and also to report of the subsequent appointment of external examiners in medicine

and surgery, in accordance with the recommendation of the University Council. The Council were instructed to ascertain whether the University charter would allow of the same facilities that had been given to Owens College students being extended to the students of other colleges when those colleges sought admission to the University. The Council were of opinion that such facilities should certainly be given.

SOCIETIES AND ACADEMIES

LONDON

Linnean Society, March 15.—Frank Crisp, treasurer and vice-president, in the chair.—Dr. T. S. Cobbold read a paper on *Simondsia paradoxa*, and on its probable affinity with *Sphaerularia bombi*. Thirty years ago Prof. Simonds discovered a remarkable parasite within cysts in the stomach of a wild boar which died in the Zoological Gardens, London. Prof. Simonds regarded the worm as a species of *Strongylus*, but Dr. Cobbold in 1864 suggested its affinities might probably be nearer the genus *Spiroptera*, then naming it *Simondsia*. The original drawings unfortunately were lost, and only quite lately, along with the specimens, they have turned up and have enabled Dr. Cobbold to investigate them more closely. He arrives at the conclusion that *Simondsia* is a genus of endoparasitic nematodes in which the female is encysted and furnished with an external and much enlarged uterus, whose walls expand into branches terminating in cæca. The male is $\frac{1}{2}$ inch and the female $\frac{1}{6}$ inch long. Moreover, it is now found that what was at first regarded as the head turns out to be the tail, so that supposed Strongyloid character is incorrect. Taking into account what is known of *Sphaerularia bombi* as interpreted by Schneider, and whose views are universally accepted, it appears that *Simondsia*, though unique, yet approaches towards *Sphaerularia* in respect of the enormously developed female reproductive organ, which in both lies outside the body proper. Until Sir J. Lubbock's memoir on *Sphaerularia* appeared, the so-called male had never been indicated; but, judged by Schneider's interpretation of that genus, the male is still unknown. Dr. Cobbold points out that the so-called rosette in *Simondsia* is morphologically a prolapsed uterus furnished with two egg-containing branches; he regards the external branched processes as homologous with the sphaerules of *Sphaerularia*, whilst the ultimate cæcal capsules have nothing comparable to them in nature.—A paper was read on the moths of the family Urapteridæ in the British Museum, by Arthur G. Butler. The author, basing distinctions on wing venation and other characters, redistributes the family, and indicates the following new genera:—*Tristrophis*, *Gonorthus*, *Siripteris*, *Nephroleuca*, *Thinopteryx*, *Xeropteryx*, and *Æschropteryx*.—The eighteenth contribution to the mollusca of the Challenger Expedition, by the Rev. R. Boog-Watson was read, in which the author treats of the family Tornatellidæ, therein describing six new species of the genus *Actæon*.

Geological Society, March 7.—J. W. Hulke, F.R.S., president, in the chair.—Messrs. Thomas Gustav Hawley, Richard Lydekker, and J. O'Donoghue were elected Fellows, and M. F. L. Cornet, of Mons, a Foreign Correspondent of the Society.—The following communications were read:—On Gray and Milne's seismographic apparatus, by Thomas Gray, B.Sc., F.R.S.E. Communicated by the President. This apparatus was stated to have for its object the registration of the time of occurrence, the duration, and the nature, magnitude, and period of the motions of the earth during an earthquake. The instrument was made by Mr. James White, Glasgow, and is to be used by Prof. John Milne in his investigations in Japan. In this apparatus two mutually rectangular components of the horizontal motion of the earth are recorded on a sheet of smoked paper wound round a drum, kept continuously in motion by clockwork, by means of two conical pendulum-seismographs. The vertical motion is recorded on the same sheet of paper by means of a compensated-spring seismograph. In details these instruments differ considerably from those described in the *Philosophical Magazine* for September, 1881, but the principle is the same. The time of occurrence of an earthquake is determined by causing the circuit of two electromagnets to be closed by the shaking. One of these magnets relieves a mechanism, forming part of a time-keeper, which causes the dial of the timepiece to come suddenly forward on the hands and then move back to its original position. The hands are provided

with ink-pads, which mark their positions on the dial, thus indicating the hour, minute, and second when the circuit was closed. The second electromagnet causes a pointer to make a mark on the paper receiving the record of the motion. This mark indicates the part of the earthquake at which the circuit was closed. The duration of the earthquake is estimated from the length of the record on the smoked paper and the rate of motion of the drum. The nature and period of the different movements are obtained from the curves drawn on the paper.—Notes on some fossils, chiefly Mollusca, from the Inferior Oolite, by the Rev. G. F. Whidborne, M.A., F.G.S.—On some fossil sponges from the Inferior Oolite, by Prof. W. J. Sollas, M.A., F.G.S. Some fossil sponges have been described from the Inferior Oolite of the Continent, but hitherto none have appeared in the lists of fossils from this formation in British localities. The collection of sponges described by the author was made by the Rev. G. F. Whidborne. The author described eleven species (six of which he identified with those already described from Continental localities) belonging to nine genera, and concluded his paper with some general remarks. These sponges are calcareous, but are considered by the author to have been originally siliceous, replacement of the one mineral by the other having taken place as already noticed by him. The beds in which these sponges are found bear all the appearance of being comparatively shallow-water deposits.—On the Dinosaurs from the Maastricht beds, by Prof. H. G. Seeley, F.R.S., F.G.S.

EDINBURGH

Royal Society, March 5.—The Right Hon. Lord Moncrieff, president, in the chair.—Prof. Turner, in a paper on bicipital ribs, described two examples which he had recently come across in the human subject. In both of these cases, one of which closely resembled a specimen in the Anatomical Museum of the University which Knox had explained as due to the fusion of a cervical with a thoracic rib, the real cause was the union of the two first thoracic ribs. That the former explanation was the true one in certain instances was demonstrated by other specimens; and the distinctive peculiarities of each kind of fusion were pointed out.—Sir William Thomson read two papers on gyrostatics and on oscillations and waves in an adynamic gyrostatic system. The papers were in great part experimental illustrations of the theorems regarding gyrostatic stability which are laid down in Thomson and Tait's "Natural Philosophy" (second edition, vol. i. part i. § 345). It was thus demonstrated to the eye that a system when under gyrostatic domination is stable in positions for which, statically considered, the system is unstable as regards an *even* number of degrees of freedom; so that, to take a particular case, a gyrostic which is unstable, because statically unstable as regards one mode, is rendered stable by making it statically unstable as regards two modes. Hence also an ordinary spinning top is stable because it is statically unstable in two of its degrees of freedom. The curious behaviour of a gyrostat resting horizontally on gimbals with its axis of rotation vertical was also shown, viz. its instability as soon as the framework on which it rested was moved in the opposite rotational sense to the spin of the gyrostat. The author then proceeded to point out that all phenomena of elasticity which are ordinarily treated by assuming forces of attraction or repulsion between parts or stresses through connections can be as readily explained by the assumption of connecting links subject only to gyrostatic domination. The gyrostatic hypothesis led to other consequences which the ordinary dynamic assumption did not involve; but it had not been found as yet that elasticity had properties corresponding to these.—Sir William Thomson also communicated a paper on the dynamical theory of dispersion, which was virtually an application of the principle of forced vibrations to a molecular structure, each molecule forming the nucleus of a region whose density increases gradually from without inwards. As bearing upon the same kind of problem, a model was shown illustrating Prof. Stokes' dynamical theory of fluorescence, which is that, if the first of a connected chain of elements is disturbed by a periodic disturbance having no close relation to the free vibration periods of the chain, the disturbance does not pass along the chain, but has its energy stored up in the first few elements, to be given back again when occasion offers.

PARIS

Academy of Sciences, March 19.—President, M. E. Blanchard.—The following communications were read:—Sum-

mary description of a new system of equatorials and its installation at the Paris Observatory, by M. M. Loewy.—Observations of the Swift-Brooks comet made at the Paris Observatory, by M. Périgaud.—Graphic proof of Euler's theorem on the partition of pentagonal numbers, by Prof. Sylvester.—Observations on blue milk (second part), by M. J. Reiset.—On the second edition of the "Pilot of Newfoundland," of Admiral Cloué, and on a question of atmospheric optics, by M. Faye.—Function of the lymphatic vessels in the production of certain pathological phenomena, by M. Alph. Guérin.—The following memoirs were presented:—On the possibility of increasing the irrigation waters of the Rhone, by means of reserves to be established in the lakes of Geneva, Bourget, and Annecy, by M. Ar. Dumont.—Determinations of longitudes effected at Chili, by the Transit of Venus Expedition, by M. de Bernardières.—On the number of the divisions of an entire number, by M. T. Q. Stieltjes.—On the equations to the partial derivatives, by M. G. Darboux.—On the application of the elliptic and ultra-elliptic intervals to the theory of unicursal curves, by M. Laguerre.—Table of reduced positive quaternary quadratic forms of which the determinant is equal or inferior to 20, by M. L. Charve.—Method of obtaining the formula giving the general integral of the differential equation—

$$x^n \frac{d^n y}{dx^n} + A_1 x^{n-1} \frac{d^{n-1} y}{dx^{n-1}} + A_2 x^{n-2} \frac{d^{n-2} y}{dx^{n-2}} + \dots + A_n y = f(x)$$

by means of a definite multiple integral, by Abbé Aoust.—New equations relative to the transmission of force, by M. Marcel Deprez.—The transmission of force by batteries of electrical apparatus, by M. James Moser.—On the maximum yield which a steam motor may attain, by M. P. Charpentier.—Influence of tempering on the electrical resistance of glass, by M. G. Fousereau.—On a modification into the bichromate of potassium pile to adapt it for lighting, by M. Trouvé.—On the calories of combination of the glycolates, by M. D. Tommaei.—On mononitrosoreoscine, by M. A. Fèvre.—Contributions to a study of the plastering of wires, by M. P. Picard.—Physiological effects of coffee, by M. J. A. Fort.—On salmon-breeding in California, by MM. Raveret-Wattel and Bartel.—On the solenoconchal molluscs of the deep sea, by M. P. Fischer.—Ovogenesis among the Ascidiaceae, by M. Ad. Sabatier.—Influence of the wind on meteorological phenomena, by M. E. Allard.—On the hailstorm of March 9 at the Hyères Salines, by M. Le Goarant de Tremelin.—The Alfanello meteorite, by M. Denza.

CONTENTS

PAGE

FIRE-FOUNTAINS	525
OUR BOOK SHELF:—	
Macdonald's "Africana, or the Heart of Heathen Africa"	526
LETTERS TO THE EDITOR:—	
Natural Selection and Natural Theology.—Prof. ASA GRAY; GEORGE J. ROMANES, F.R.S.	527
The High Springs of 1883.—P. L. SCLATER, F.R.S.	529
Scorpion Suicide.—C. LLOYD MORGAN	530
Nesting Habits of the Emu.—ALFRED W. BENNETT	530
The Recent Cold Weather.—WILLIAM INGRAM	530
Sap-Flow.—F. M. BURTON	530
Foamballs.—J. RAND CAPRON	531
Meteor; the Transit; the Comet.—CONSUL E. L. LAYARD	531
Ticks.—W. E. L.	531
Ignition by Sunlight.—Major W. J. HERSCHEL; EDMUND H. VERNER	531
Mimicry.—H. J. MORGAN	531
Braces or Waistband?—R. M.	531
SINGING, SPEAKING, AND STAMMERING, II. By W. H. STONE, M.B., F.R.C.P.	531
PROFESSOR SCHIAPARELLI ON THE GREAT COMET OF 1882. By FRANCIS PORRO	533
THE SOARING OF BIRDS. By Lord RAYLEIGH, F.R.S.	534
PHILIP CHRISTOPH ZELLER. By R. McLACHLAN, F.R.S.	535
THE GREAT INTERNATIONAL FISHERIES EXHIBITION (<i>With Illustration</i>)	536
NOTES	538
OUR ASTRONOMICAL COLUMN:—	
The Great Comet of 1882	540
Variable Stars	540
The Late Transit of Venus	541
GEOGRAPHICAL NOTES	541
FACTS AND CONSIDERATIONS RELATING TO THE PRACTICE OF SCIENTIFIC EXPERIMENTS ON LIVING ANIMALS, COMMONLY CALLED VIVISECTION	542
THE BRITISH ASSOCIATION AND CANADA	546
UNIVERSITY AND EDUCATIONAL INTELLIGENCE	547
SOCIETIES AND ACADEMIES	547